Received: 2 February 2018 | Revised: 10 May 2018 | Accepted: 19 May 2018

DOI: 10.1111/jonm.12672

ORIGINAL ARTICLE

WILEY

Development and psychometric testing of the clinical leadership needs analysis (CLeeNA) instrument for nurses and midwives

Vera J. C. Mc Carthy | Ashling Murphy | Eileen Savage | Josephine Hegarty | Alice Coffey | Patricia Leahy-Warren | Aine Horgan | Rhona O'Connell | Lynne Marsh | Jonathan Drennan

School of Nursing and Midwifery, University College Cork, Cork, Ireland

Correspondence
Vera J. C. Mc Carthy, School of Nursing and Midwifery, University College Cork, Brookfield Health Sciences Complex, Cork, Ireland.
Email: v.mccarthy@ucc.ie

Funding information
This study was funded by The National Leadership and Innovation Centre for Nursing and Midwifery, Office of the Nursing and Midwifery Services Director, Health Service Executive, Ireland.

Abstract

Aim: The aim of this study is to report the development and psychometric testing of the clinical leadership needs analysis instrument (CLeeNA).

Background: Limited emphasis is placed on the clinical leadership needs of nurses and midwives that are fundamental to supporting the delivery of high quality, safe patient care.

Methods: A development and validation study of CLeeNA was undertaken using cross-sectional data. A sample of 324 registered nurses and midwives completed the questionnaire using a 7-point adjectival scale. Principal component analysis was conducted to explore scale grouping of items (n = 103 items).

Results: Principal component analysis, item reduction and parallel analysis on the items of the instrument resulted in seven factors consisting of 56 items. These factors were identified as: Staff and Care Delivery; Technology and Care Initiatives; Self and Team Development; Standards of Care; Financial and Service Management; Leadership and Clinical Practice; Patient Safety and Risk Management.

Conclusion: The identified factors are reflective of an ever-changing health care environment.

Implications for Nursing Management: Potentially, after further testing, this instrument could be used by nursing management and educators to measure clinical leadership needs, inform the design of clinical leadership training programmes and provide valuable information about health care leadership development.

KEYWORDS
clinical leadership needs, instrument development, midwives, nurses, psychometric testing

1 | BACKGROUND

Nursing and midwifery leadership is a difficult term to define and often lacks clarity (Barr & Dowding, 2012). Within the literature, leadership is often considered a multifaceted construct, predominantly measured as leadership styles, behaviours, competencies and practices. Although significant focus has been put on how leadership is measured, with the development of various instruments such as the Multifactor Leadership Questionnaire (Bass & Avolio, 2000), the Managerial Practice Survey (Yukl, Wall, & Lepsinger, 1990) and the

Path-Goal Leadership Questionnaire (House, 1971), few instruments have examined the specific clinical leadership needs of registered nurses and midwives. An exception to this was Casey, McNamara, Fealy, and Geraghty (2011) in their study on a sample of nurses and midwives in Ireland. These researchers found that highly rated leadership developmental needs were related to managing clinical areas and patient care. Good leadership behaviours in the clinical area positively influence care (Frankel, 2008; Galuska, 2014) and thus impact on how leadership is perceived to be performed in the clinical environment.

The challenge of empirically testing the impact of leadership on patient outcomes was recognized in the literature (West et al., 2015). A systematic review of published literature on the relationship between nursing leadership practices and patient outcomes was conducted by Wong, Cummings, and Ducharme (2013). Evidence of an association between positive relational leadership styles and higher patient satisfaction, lower patient mortality, medication errors, restraint use and hospital-acquired infections was found (Wong et al., 2013). It was suggested that organisational efforts to develop transformational and relational leadership would reinforce organisational strategies and improve patient outcomes. Broadly speaking, the literature is focused on either transformational or transactional leadership styles rather than what the needs of nurses or midwives are in relation to leading in health care.

The importance of tailored leadership training, designed to meet the needs of the registered nurse or midwife and their level of responsibility, in addition to the service need, has been highlighted in the literature (Enterkin, Robb, & McLaren, 2013; Fitzpatrick, Modic, Van Dyk, & Hancock, 2016; Patton et al., 2013). Cultural change in relation to leadership can be made if programmes are designed and delivered within the specific culture, acknowledging and taking into account the importance of the organisation's vision and values (West et al., 2015). Leadership training should be offered to all registered nurses and midwives as this contributes to the future nursing and midwifery leadership pipeline (Titzer, Shirey, & Hauck, 2014), promotes professional and personal growth (Paterson, Henderson, & Burmeister, 2015) and prepares leaders to resolve conflict, communicate effectively and respond to complaints (Duffy & Carlin, 2014). Nurses in the USA identified the need to develop skills in areas such as personal leadership; influencing policy; networking; budgeting and finance; and serving on a health care organisation board as important for professional leadership development (Peltzer et al., 2015). Nursing positions at director of nursing level and above, were strongest in leadership practices, whilst those at managerial level and below were identified as needing additional leadership development (Herman, Gish, & Rosenblum, 2015). However, the specific leadership development needs and how they are delivered are important aspects to consider and account for with regard to registered nurses and midwives.

Barriers to the development of registered nurses and midwives in relation to leading in patient care in clinical areas need to be identified. Denker, Sherman, Hutton-Woodland, Brunell, and Medina (2015) identified several barriers to nurse leadership, including: their absence in policy making, lacking a unified voice, problematic public perception of nursing roles and a lack of leadership resources to enhance leadership skills. Furthermore, workplace regulations (El Amouri & O'Neill, 2014), uncertainty about nurse leaders' responsibility in relation to performance related goals, quality indicators being met, ineffective communication and frequent policy changes in volatile clinical environments can hinder the development of leaders (Dyess, Sherman, Pratt, & Chiang-Hanisko, 2016).

Galuska (2014) identified that the "what," or the content of nursing leadership education must be firmly grounded in contemporary leadership theory and evidence, relevant to learners, and tailored to meet their needs. The "how," or the delivery, of leadership education is a significant determinant of the effectiveness of teaching and learning for leaders. The "so what," or the difference, that formal nursing education can have on the ability of nurses to learn to lead and for patients, teams, and organisations to benefit is significant. However, there are many "what ifs," or possible threats to learning and applying newly learned leadership knowledge and achieving competency. It is important to adequately measure the leadership needs for all levels of registered nurses and midwives to identify what is needed in an ever-changing health care environment. Leadership needs for registered nurses or midwives at the bedside and beyond need to be investigated by an instrument designed to examine the importance of an aspect of clinical leadership. With that in mind, a clinical leadership needs analysis (CLeeNA) instrument was developed and tested on a sample of registered nurses and midwives.

2 | AIM

The aim of this study is to report on the development and psychometric testing of the clinical leadership needs analysis (CLeeNA) instrument for nurses and midwives.

3 | MATERIAL AND METHODS

3.1 | Design

The study was conducted in two phases: Phase 1 was the development of CLeeNA. A cross-sectional study was then conducted on a national sample of nurses and midwives in the Republic of Ireland using the newly developed instrument. Data from this study were used for Phase 2, testing the psychometric properties of the instrument.

3.2 | Phase 1: Development of the clinical leadership needs analysis (CLeeNA) instrument

The clinical leadership needs analysis (CLeeNA) instrument items were derived from the most relevant literature pertaining to clinical leadership needs (American Organization of Nurse Executives (Producer), 2015; Daly, Jackson, Mannix, Davidson, & Hutchinson, 2014; Denker et al., 2015; National Health Service Leadership Academy (Producer), 2013). The review of the literature allowed a theory of clinical leadership needs to be formulated and tested

by CLeeNA. Following the thorough review and critical analysis of the relevant literature, 103 items were developed. These items addressed management (service, information, strategic, financial and people), human factors (teamwork, communication and self-development), professional role (patient safety, decision making, accountability, leadership capabilities, leadership in clinical practice, evidence-based practice), governance, workforce planning, diversity and implementing change. Pilot testing of the instrument prior to distribution to the sample was not conducted due to time constraints.

The leadership needs were scored on a 7-point adjectival scale. The scale assessed the importance of leadership needs for the respondent, asking them to indicate the most appropriate response on the scale (1, not important to 7, highly important).

3.3 | Sample and data collection

Data were collected between April and July 2017. The instrument was administered in two formats: electronically and by post. Previous researchers have used two methods of instrument distribution (online and postal) finding no significant difference in the results; however, they do warn of potential sampling bias with online questionnaires (Smith, King, Butow, & Olver, 2013; Ward, Clark, Zabriskie, & Morris, 2014). This bias relates to more highly educated participants showing a preference for online completion. In line with data protection legislation, e-mails were sent by the Health Service Executive (HSE) to corporate level registered nurses and midwives (director and above) (n = 236) with a link to the electronic questionnaire on behalf of the research team; the research team did not have access to email addresses. A number of out-of-office replies indicated the intended recipients were on leave or had left that post (n = 45). A reminder email containing the online questionnaire link was sent 2 weeks after the initial email. It was not possible to calculate a response rate from the electronic distribution of the questionnaire as determining the exact number of recipients of the email (if the original recipient circulated it to their staff) was not feasible. In total 97 respondents completed the online questionnaire.

The postal questionnaire was sent to a random sample of nurses and midwives on the Register of Nurses and Midwives (n = 2,200) maintained by the Nursing and Midwifery Board of Ireland (NMBI). This random sample was generated by the NMBI. The rationale for this sampling design was to ensure that registered nurses and midwives from the active file of the Register were represented thus, increasing generalizability of the results to each of the divisions within the register. A letter explaining the project, consent form, questionnaire and FREEPOST return envelope were included in the posting to each potential respondent. A reminder letter was sent 2 weeks after the initial mailing. A number of the registered nurses and midwives who were sent the postal questionnaire were retired but still on the Register of Nurses and Midwives or working abroad (as reported by email or phone by self or family member) (n = 18). A small number of questionnaires were returned not completed (n = 13) and others were undeliverable or had unknown at the address (n = 10). We do not have data on what proportion of clinical staff or managers received the postal questionnaire as this level of information was not available from the NMBI. In total, a response rate (taking into account those who were retired/abroad/unknown at address) of 11% (n = 227) was obtained from the postal questionnaire. Data from the electronic and postal questionnaire were combined for the analyses (n = 324). Due to some missing data a total of n = 321 were available for PCA.

3.4 | Phase 2: Psychometric testing

IBM SPSS Statistics Version 22 (IBM, Armonk, NY, USA) was used to analyse the data. Data were entered directly into SPSS and descriptive statistics conducted to check for any errors. Principal components analysis (PCA) with Oblimin rotation was conducted (Tabachnick & Fidell, 2007) to explore scale grouping for the 103 items of CLeeNA for the importance of each of the clinical leadership needs. An appropriate Kaiser-Meyer-Oklin test for sampling adequacy and Bartlett's test of sphericity, scree plots and eigenvalues >1 were initially used to identify factors, with a threshold value of 0.4 for item loading coefficients. The analyses were conducted in three major parts. Part 1 involved exploring scale grouping and identifying the number of factors that the 103 items loaded onto using a scree test, percentage of variance accounted for and parallel analysis (Horn, 1965). Part 2 involved an Oblimin rotation with Kaiser normalization on the retained factors as there was a strong correlation between the components (Tabachnick & Fidell, 2007). Finally, in Part 3, an examination of items that were loading onto each of the factors was completed and each of the identified factors were named. Internal reliability analyses were then conducted on each of the retained factors and factor refinement through item reduction was completed (if Cronbach's alpha was >0.90). Item reduction was conducted by calculating the alpha for the four items that loaded highest on any factor with a Cronbach's alpha >0.90 initially and then adding the next two highest loading items to the initial four items until all items were added. If the addition of the next two highest loadings resulted in an alpha >0.90 these items and all lower loading items were omitted. A repeat factor analysis was conducted on the refined factors with repeat reliability analyses as required.

3.5 | Ethical considerations

Ethical approval was obtained from the Clinical Research Ethics Committee affiliated to the researchers' University. Written informed consent was obtained from all study respondents.

4 | RESULTS

Demographic data for the sample are presented in Table 1. The sample had an age range of 23–67 years with over three-quarters aged 40 years or over. The majority were female (91%), were in a staff nurse/midwife position (38%) and were working in a general nursing setting (23%). Just over half of the sample held a Bachelor's Degree or higher (56%) with similar proportions completing leadership training.

TABLE 1 Demographic details of the sample, *n* = 321

Sample characteristics	Mean (*SD*)	*n* (%)
Age[a]	46.5 (10.01)	
Gender[a]		
Female		294 (91)
Position[a]		
Assistant Director/Director of Nursing/Midwifery/Public Health or above position		62 (20)
Clinical Nurse/Midwife Specialist/Advanced Nurse/Midwife Practitioner		32 (10)
Clinical Nurse/Midwife Manager		103 (32)
Staff Nurse/Midwife		119 (38)
Area of work		
Older adult		16 (5)
Community		40 (12)
Children		46 (14)
General		73 (23)
Intellectual disability		55 (17)
Mental health		39 (12)
Midwifery		42 (13)
Primary care		3 (1)
Other (academic, cross services)		7 (3)
Qualification		
Certificate		26 (8)
Diploma		43 (13)
Higher/Postgraduate diploma		70 (22)
Bachelor's degree		104 (32)
Master's degree		74 (23)
PhD		2 (1)
Other		2 (1)
Completed leadership training[a]		
Yes		172 (55)

[a]Missing data.

4.1 | Principal component analysis of the importance of clinical leadership needs items

Preliminary analysis showed a number of coefficients of 0.4 or above with Kaiser-Meyer-Oklin test for sampling adequacy (0.935) and Bartlett's test of sphericity (χ^2 = 25,807.9; *df* = 5,253; $p < 0.01$). Twenty components with eigenvalues >1 were identified. An inspection of the scree test revealed a break after the seventh component. This was confirmed by parallel analysis which displayed seven components with eigenvalues exceeding the corresponding criterion values for the randomly generated data matrix on a sample of 100 items for 321 respondents.

4.2 | Importance of clinical leadership needs analysis factors

Not all of the items loaded onto a component. In total 77 items loaded. Twelve items loaded on two different factors (with a threshold value of 0.4 for item loading coefficients). The number of items that loaded onto the individual factors and the variance explained by each component can be seen in Table 2 with the internal consistency for each of the factors examined using Cronbach's alphas.

Factors 1–3 and factor 5 had alphas >0.90 which suggested redundant items. These factors were further refined through item reduction. Resultant alphas, number of items and variance explained are outlined in Table 2.

Following item reduction, PCA with Oblimin rotation was conducted again to ensure the items all loaded onto the previously identified factor. The correlation matrix showed a number of coefficients of 0.4 and above with a Kaiser-Meyer-Oklin test for sampling adequacy (0.925) and Bartlett's test of sphericity (χ^2 = 11,660.7; *df* = 1,540; $p < 0.01$). Parallel analysis revealed seven components (as previously identified) with eigenvalues exceeding the corresponding criterion values for the randomly generated data matrix on a sample of 56 items for 321 respondents.

Table 3 presents the factor loading, total variance accounted for and a matrix of the correlations among the factors. The correlations were small to medium in magnitude. The item "Rate the importance to promote sharing of information and resources" loaded highly onto factor 2 and factor 5, however, it was assigned to factor 5 as it intuitively fitted within this domain.

Table 4 details the mean, standard deviation and item-total correlations for all 56 items under their identified factors. The individual factor means were high, indicating high importance of leadership development needs.

5 | DISCUSSION

5.1 | Summary

This paper presents a new instrument (CLeeNA) for the assessment of clinical leadership needs for registered nurses and midwives. We identified seven dimensions: self and team development; staff and care delivery; technology and care initiatives; financial and service management; leadership and clinical practice; patient safety and risk management; and standards of care.

5.2 | Comparison with previous instruments

Although a number of questionnaires investigating leadership have been validated for use (Bass & Avolio, 2000; House, 1971; Yukl et al., 1990) few are specific to the nursing and midwifery professions. Casey et al. (2011) previously designed and validated an instrument for use with a sample of Irish based nurses and midwives. Five dimensions for clinical leadership development needs were identified: managing clinical area; managing patient care; development of

TABLE 2 Original and revised number of items loaded onto the individual factors for importance, explained variance and Cronbach's alpha

	Original number of items loaded[a]			Revised number of items loaded[b]		
Factor	Number of items	Explained variance	Cronbach's alpha	Number of items	Explained variance	Cronbach's alpha
Factor 1: self & team development	12	22.6%	0.91	10	11.1%	0.89
Factor 2: staff & care delivery	15	19.1%	0.94	6	8.7%	0.89
Factor 3: technology & care initiatives	12	20.2%	0.92	6	9.2%	0.89
Factor 4: financial & service management	10	18.7%	0.92	6	8.5%	0.89
Factor 5: leadership & clinical practice	11	15.5%	0.86	11	7.7%	0.86
Factor 6: patient safety & risk management	9	18.0%	0.89	9	11.0%	0.89
Factor 7: standards of care	8	10.8%	0.86	8	6.3%	0.86

[a]Before item reduction to Factors 1, 2, 3 and 5.
[b]Post item reduction to Factors 1, 2, 3 and 5.

the individual; development of the profession and skills for clinical leadership. These differ from our present instrument and this difference may be reflective of a rapidly changing health care environment. Items relating to technology, finance and service management have been incorporated into our instrument and are necessary and relevant to the role of the nurse and midwife today, particularly those in management positions. Additionally, morale amongst registered nurses and midwives in Ireland has been reported at relatively low levels (Scott et al., 2013) thus, dimensions such as staff and care delivery that include items on promoting staff retention and staff satisfaction were deemed important. CLeeNA has the capacity to measure the contemporary needs for nurses and midwives and potentially identify where the leadership needs are for these professionals.

CLeeNA was designed after a thorough critical analysis of contemporary literature pertaining to nursing and midwifery leadership (American Organization of Nurse Executives (Producer), 2015; Daly et al., 2014; Denker et al., 2015; National Health Service Leadership Academy, 2013). It reflects a changing health care environment which is characterized by a need for core nursing skills, technological advancements and risk management. It is reflective of the leadership needs that were identified from the literature review. CLeeNA can potentially inform the profession about the importance registered nurses or midwives, at all positions, based on these factors. Furthermore, this instrument, after further testing, can be used at a local level to tailor leadership programmes to meet the needs of the specific health care environment as highlighted in the literature (Enterkin et al., 2013; Fitzpatrick et al., 2016; Patton et al., 2013). This will allow a cultural change in relation to leadership, particularly if the leadership programme is designed and delivered in a specific organisation where the values and vision of that environment are acknowledged (West et al., 2015). Offering leadership training to all registered nurses and midwives can facilitate the professional and personal growth of tomorrow's health care leaders who will be competent to deal with and resolve complex issues (Duffy & Carlin, 2014; Paterson et al., 2015; Titzer et al., 2014). CLeeNA will potentially allow valuable information on leadership needs to be obtained and allows measurement of self and team development, standards of care and care delivery, which are important components of the health care environment.

Our instrument was administered using two different methods: online and postal. Previous researchers have collected data using combined online and postal methods (Ward et al., 2014) and no significant difference in results from the two approaches were found. Using two separate methods to collect data can balance out any weakness in each of the approaches (Dillman, 2000) and address sampling issues such as over representation of staff positions from the postal method. The use of online questionnaires is seen as superior to postal because of the anonymity they allow, the high data quality, the lower nonresponse rates and faster returns (Smith et al., 2013). Our online questionnaire was emailed to senior management. Some of these managers forwarded the instrument to their staff, which resulted in 10% of the online questionnaire being completed by staff nurses and staff midwives. The postal questionnaire was sent to a random sample of nurses and midwives on the Register of Nurses and Midwives held by the NMBI (including all disciplines of nursing). Staff nurses and staff midwives accounted for 49% of returned postal questionnaires.

6 | IMPLICATIONS FOR NURSING AND MIDWIFERY MANAGEMENT

Clinical leadership, as demonstrated by registered nurses and midwives in a dynamic and adapting health care system, is of vast importance particularly in relation to patient safety and risk management. A specific instrument to measure clinical leadership for nurses and midwives is necessary to precisely target and address their identified needs. Leadership had previously been associated with nurses working at an executive level; however, more recently there has been a move towards incorporating and identifying leadership at all positions of nursing (Institute of Medicine (US) (2011); National Health Service Leadership Academy, 2013). Health care systems require effective leadership to accommodate the complex challenges

TABLE 3 Direct Oblimin rotated factor structure matrix with correlations among the factors

	Factor						
	1	2	3	4	5	6	7
Rate the importance to identify the impact of your behaviour on others	**0.85**	0.21	0.29	−0.27	0.24	0.33	0.29
Rate the importance to obtain, analyse and act on feedback on your own leadership style	**0.82**	0.24	0.38	−0.36	0.30	0.39	0.31
Rate the importance to identify your own strengths and limitations	**0.71**	0.31	0.35	−0.30	0.21	0.36	0.35
Rate the importance to serve as a change leader	**0.70**	0.48	0.41	−0.42	0.21	0.41	0.12
Rate the importance of effective critical-thinking skills and decision-making strategies	**0.70**	0.49	0.40	−0.36	0.37	0.50	0.27
Rate the importance to motivate a group to accomplish change	**0.64**	0.57	0.45	−0.40	0.27	0.52	0.11
Rate the importance to use change theory to implement change	**0.64**	0.45	0.51	−0.46	0.26	0.49	0.09
Rate the importance of recognizing the common purpose of a team	**0.64**	0.36	0.34	−0.37	0.33	0.48	0.25
Rate the importance to acknowledge mistakes and treat them as learning opportunities	**0.62**	0.33	0.25	−0.17	0.27	0.48	0.34
Rate the importance to establish an environment that values diversity (e.g. age, gender, race, religion, ethnicity, sexual orientation, culture)	**0.57**	0.17	0.24	−0.26	0.33	0.30	0.24
Rate the importance to promote staff retention	0.34	**0.85**	0.22	−0.19	0.31	0.31	0.22
Rate the importance to assess staff satisfaction	0.36	**0.79**	0.23	−0.21	0.36	0.41	0.28
Rate the importance of identifying educational needs of existing nursing/midwifery staff	0.43	**0.74**	0.30	−0.36	0.35	0.39	0.28
Rate the importance of representing patient care issues to the governing body/hospital board	0.31	**0.74**	0.33	−0.29	0.41	0.38	0.32
Rate the importance of determining current and future supply and demand for nurses/midwives to meet health care delivery needs in practice	0.24	**0.73**	0.29	−0.36	0.36	0.30	0.21
Rate the importance to support team members to provide good patient care and better services	0.46	**0.72**	0.30	−0.32	0.38	0.43	0.34
Rate the importance to identify technological trends and developments as they apply to patient care	0.36	0.25	**0.88**	−0.37	0.24	0.29	0.11
Rate the importance to use data management systems for decision making	0.28	0.15	**0.84**	−0.41	0.24	0.24	0.12
Rate the importance to participate in the evaluation of patient-related technology in practice settings	0.36	0.23	**0.83**	−0.35	0.31	0.31	0.31
Rate the importance to provide leadership for the implementation of IT systems	0.41	0.20	**0.78**	−0.44	0.23	0.44	0.14
Rate the importance to use technology to support improvement of clinical performance	0.29	0.28	**0.78**	−0.22	0.18	0.22	0.29
Rate the importance to design and interpret outcome measures	0.41	0.19	**0.69**	−0.41	0.29	0.53	0.13
Rate the importance to forecast future revenue and expenses	0.29	0.25	0.44	**−0.91**	0.18	0.25	0.23
Rate the importance to interpret financial statements	0.30	0.17	0.32	**−0.88**	0.21	0.27	0.17
Rate the importance to create and monitor a budget	0.31	0.28	0.31	**−0.87**	0.12	0.28	0.23
Rate the importance to understand budgetary issues that affect an organisation's finances	0.33	0.22	0.34	**−0.86**	0.23	0.30	0.21
Rate the importance to develop a leadership succession plan	0.36	0.29	0.48	**−0.63**	0.21	0.40	0.26
Rate the importance to promote systems thinking as an expectation of leaders and staff	0.47	0.23	0.45	**−0.58**	0.21	0.40	0.26
Rate the importance of gathering feedback from patients/service users to help service develop plans	0.26	0.16	0.18	−0.15	**0.78**	0.24	0.09
Rate the importance to gather feedback from colleagues to help service develop plans	0.28	0.39	0.11	−0.15	**0.77**	0.28	0.08
Rate the importance of support plans for services that are part of the wider health care system	0.36	0.30	0.36	−0.26	**0.70**	0.27	0.19
Rate the importance to take action when resources are not being used effectively and efficiently	0.24	0.38	0.17	−0.28	**0.67**	0.24	0.03
Rate the importance of identifying the appropriate resources required to deliver safe and effective patient care	0.17	0.33	0.26	−0.10	**0.64**	0.25	0.26
Rate the importance to build collaborative teams	0.46	0.36	0.25	−0.11	**0.61**	0.21	0.16
Rate the importance to create opportunities to bring individuals and groups together to achieve goals	0.49	0.52	0.28	−0.17	**0.59**	0.29	0.07
Rate the importance to promote sharing of information and resources	0.46	0.57	0.25	−0.18	**0.56**	0.26	0.07

(Continues)

TABLE 3 (Continued)

	Factor						
	1	2	3	4	5	6	7
Rate the importance of having a clear sense of team roles and responsibilities	0.28	0.31	0.22	−0.31	**0.54**	0.36	0.11
Rate the importance to ensure that services are delivered within allocated resources	0.14	0.12	0.29	−0.15	**0.51**	0.12	0.26
Rate the importance of keeping the focus of contribution on delivering and improving services to patients	0.38	0.21	0.31	−0.03	**0.49**	0.40	0.20
Rate the importance to monitor clinical activities to identify both expected and unexpected risks	0.33	0.40	0.31	−0.27	0.27	**0.80**	0.28
Rate the importance to facilitate staff education on risk management and compliance issues	0.39	0.24	0.37	−0.31	0.33	**0.78**	0.37
Rate the importance to ensure compliance by staff with all required standards	0.41	0.28	0.30	−0.46	0.24	**0.75**	0.34
Rate the importance to support a no-blame reporting environment for identifying unsafe practices	0.38	0.29	0.29	−0.21	0.27	**0.74**	0.35
Rate the importance to respond and act upon safety recommendations	0.36	0.37	0.23	−0.22	0.27	**0.74**	0.17
Rate the importance to identify areas of risk/liability	0.38	0.53	0.26	−0.32	0.24	**0.72**	0.34
Rate the importance to create solutions to health care risks through collaborative working	0.53	0.23	0.40	−0.30	0.26	**0.70**	0.42
Rate the importance to obtain and act on patient/service user feedback and experiences	0.43	0.16	0.30	−0.28	0.22	**0.68**	0.42
Rate the importance to use data to inform decision making	0.38	0.14	0.53	−0.35	0.35	**0.53**	0.06
Rate the importance to advocate for optimal health care	0.42	0.32	0.41	−0.31	0.23	0.48	**0.76**
Rate the importance to represent the perspective of patients and families	0.43	0.34	0.32	−0.32	0.21	0.39	**0.69**
Rate the importance to ensure protection of human subject rights and safety in clinical research	0.39	0.22	0.28	−0.29	0.27	0.46	**0.69**
Rate the importance to involve nurses/midwives in decisions that affect their practice	0.38	0.49	0.29	−0.27	0.27	0.31	**0.68**
Rate the importance to adhere to the Nursing and Midwifery Board of Ireland standards of nursing/midwifery practice	0.26	0.22	0.11	−0.19	0.09	0.34	**0.66**
Rate the importance to promote the nursing/midwifery perspective in organisational decisions	0.57	0.38	0.40	−0.42	0.33	0.42	**0.61**
Rate the importance to consider the impact of nursing/midwifery decisions on the health care organisation as a whole	0.35	0.25	0.38	−0.51	0.29	0.39	**0.57**
Rate the importance to ensure that written clinical policies and procedures are reviewed and updated in accordance with evidence-based practice	0.36	0.12	0.17	−0.30	0.27	0.54	**0.55**
Percentage of total variance accounted for	11.1	8.6	9.2	8.5	7.7	11.0	6.3
Factor intercorrelations							
Factor 1							
Factor 2	0.33						
Factor 3	0.36	0.22					
Factor 4	−0.32	−0.23	−0.37				
Factor 5	0.31	0.32	0.26	−0.17			
Factor 6	0.44	0.31	0.32	−0.31	0.28		
Factor 7	0.27	0.18	0.20	−0.20	0.16	0.31	

Note. Factor loadings onto individual factors is identified in Bold.

within the sector as well as to aid in providing high quality, safe, efficient care that is both cost effective and tangible (Northouse, 2016).

7 | STRENGTHS AND LIMITATIONS OF THE STUDY

CLeeNA has the capacity to measure contemporary needs for nurses and midwives. These needs have changed in response to modern health care which is person-centred with an emphasis on safe, high standard care utilizing technological advances within a closely monitored financial budget. Nevertheless, additional research, in this area, is needed with a larger sample size using CLeeNA. As previously discussed, we do not have data on the proportion of staff or managers that received the postal questionnaire. The low response rate demonstrates the current problematic nature of using postal surveys for data collection purposes in health care (Cook, Dickinson, & Eccles, 2009). Nulty (2008) depicts that lower response rates (30%–60%) may also offer valid results (although more liberal conditions) when considering the sample group and representation of the population.

TABLE 4 Item performance of the clinical leadership needs analysis instrument (n = 321) with overall factor means and standard deviation

Item	Mean	*SD*	Corrected item-total correlation	Cronbach's alpha if item deleted	Factor Cronbach's alpha
Factor 1: Self & Team Development	65.58	5.39			0.89
Rate the importance to identify the impact of your behaviour on others	6.67	0.65	0.67	0.88	
Rate the importance to obtain, analyse and act on feedback on your own leadership style	6.55	0.73	0.68	0.88	
Rate the importance to identify your own strengths and limitations	6.70	0.64	0.62	0.88	
Rate the importance to serve as a change leader	6.29	1.01	0.75	0.87	
Rate the importance of effective critical-thinking skills and decision-making strategies	6.61	0.65	0.69	0.88	
Rate the importance of recognising the common purpose of a team	6.66	0.57	0.61	0.89	
Rate the importance to use change theory to implement change	6.17	1.11	0.70	0.88	
Rate the importance to motivate a group to accomplish change	6.49	0.85	0.73	0.88	
Rate the importance to establish an environment that values diversity (e.g. age, gender, race, religion, ethnicity, sexual orientation, culture)	6.65	0.65	0.49	0.89	
Rate the importance to acknowledge mistakes and treat them as learning opportunities	6.77	0.48	0.54	0.89	
Factor 2: Staff & Care Delivery	40.47	3.06			0.89
Rate the importance to promote staff retention	6.82	0.60	0.77	0.86	
Rate the importance to assess staff satisfaction	6.71	0.69	0.76	0.87	
Rate the importance to support team members to provide good patient care and better services	6.78	0.51	0.68	0.88	
Rate the importance of representing patient care issues to the governing body/hospital board	6.66	0.67	0.69	0.88	
Rate the importance of identifying educational needs of existing nursing/midwifery staff	6.74	0.65	0.71	0.87	
Rate the importance of determining current and future supply and demand for nurses/midwives to meet health care delivery needs in practice	6.76	0.65	0.69	0.88	
Factor 3: Technology & Care Initiatives	36.76	5.16			0.89
Rate the importance to identify technological trends and developments as they apply to patient care	5.98	1.10	0.82	0.86	
Rate the importance to participate in the evaluation of patient-related technology in practice settings	6.21	0.96	0.76	0.87	
Rate the importance to use data management systems for decision making	5.84	1.27	0.75	0.88	
Rate the importance to use technology to support improvement of clinical performance	6.39	0.91	0.67	0.89	
Rate the importance to provide leadership for the implementation of IT systems	6.14	1.16	0.74	0.88	
Rate the importance to design and interpret outcome measures	6.20	0.91	0.62	0.89	
Factor 4: Financial & Service Management	36.65	5.65			0.89
Rate the importance to forecast future revenue and expenses	6.11	1.23	0.84	0.86	
Rate the importance to interpret financial statements	5.88	1.32	0.80	0.87	
Rate the importance to understand budgetary issues that affect an organisation's finances	6.08	1.22	0.80	0.87	
Rate the importance to create and monitor a budget	6.21	1.12	0.78	0.87	
Rate the importance to develop a leadership succession plan	6.24	0.99	0.60	0.89	
Rate the importance to promote systems thinking as an expectation of leaders and staff	6.11	1.01	0.55	0.90	
Factor 5: Leadership & Clinical Practice	71.79	5.64			0.86
Rate the importance of gathering feedback from patients/service users to help service develop plans	6.45	0.95	0.60	0.84	
Rate the importance to gather feedback from colleagues to help service develop plans	6.44	1.02	0.66	0.84	
Rate the importance of support plans for services that are part of the wider health care system	6.23	0.93	0.64	0.84	
Rate the importance of identifying the appropriate resources required to deliver safe and effective patient care	6.78	0.51	0.56	0.85	
Rate the importance to take action when resources are not being used effectively and efficiently	6.54	0.82	0.58	0.85	
Rate the importance to build collaborative teams	6.71	0.60	0.59	0.85	
Rate the importance to create opportunities to bring individuals and groups together to achieve goals	6.46	0.82	0.63	0.84	

(Continues)

TABLE 4 (Continued)

Item	Mean	*SD*	Corrected item-total correlation	Cronbach's alpha if item deleted	Factor Cronbach's alpha
Rate the importance of having a clear sense of team roles and responsibilities	6.68	0.57	0.49	0.85	
Rate the importance to promote sharing of information and resources	6.57	0.80	0.58	0.85	
Rate the importance to ensure that services are delivered within allocated resources	6.30	0.92	0.40	0.86	
Rate the importance of keeping the focus of contribution on delivering and improving services to patients.	6.64	0.60	0.46	0.85	
Factor 6: Patient Safety & Risk Management	59.82	4.27			0.89
Rate the importance to respond and act upon safety recommendations	6.80	0.49	0.64	0.89	
Rate the importance to monitor clinical activities to identify both expected and unexpected risks	6.60	0.68	0.74	0.88	
Rate the importance to support a no-blame reporting environment for identifying unsafe practices	6.71	0.69	0.68	0.88	
Rate the importance to facilitate staff education on risk management and compliance issues	6.66	0.60	0.75	0.88	
Rate the importance to ensure compliance by staff with all required standards	6.69	0.56	0.71	0.88	
Rate the importance to identify areas of risk/liability	6.72	0.57	0.67	0.88	
Rate the importance to obtain and act on patient/service user feedback and experiences	6.63	0.70	0.66	0.88	
Rate the importance to create solutions to healthcare risks through collaborative working	6.61	0.64	0.70	0.88	
Rate the importance to use data to inform decision making	6.41	0.82	0.47	0.90	
Factor 7: Standards of Care	53.77	3.23			0.86
Rate the importance to ensure protection of human subject rights and safety in clinical research	6.75	0.55	0.63	0.84	
Rate the importance to advocate for optimal healthcare	6.77	0.53	0.75	0.83	
Rate the importance to adhere to the Nursing and Midwifery Board of Ireland standards of nursing/midwifery practice	6.89	0.36	0.50	0.86	
Rate the importance to involve nurses/midwives in decisions that affect their practice	6.78	0.49	0.67	0.84	
Rate the importance to represent the perspective of patients and families	6.75	0.55	0.66	0.84	
Rate the importance to ensure that written clinical policies and procedures are reviewed and updated in accordance with evidence-based practice	6.80	0.45	0.52	0.85	
Rate the importance to promote the nursing/midwifery perspective in organisational decisions	6.59	0.69	0.68	0.83	
Rate the importance to consider the impact of nursing/midwifery decisions on the health care organisation as a whole	6.44	0.81	0.57	0.86	

Thus, response rates should not be the sole requiem of the quality of the data but rather used in conjunction with the sampling technique to determine generalizability of results. However, additional research in this area is needed with a larger sample size with test–retest reliability conducted to establish the consistency of the instrument. While face validity of the instrument was conducted in its original format, this needs to be repeated post PCA. Although the dimensions of CLeeNA make intuitive sense, PCA is only an initial technique to explore the number of factors that measure common items. Further studies should be conducted with larger samples, using a confirmatory analysis approach before CLeeNA is ready for use as an instrument to measure leadership needs of nurses and midwives.

Although the sample size was small in relation to the number of items on the instrument, previous researchers have addressed this issue and did not find a minimum level of respondents to variables (Hogarty, Hines, Kromrey, Ferron, & Mumford, 2005). Furthermore, appropriate sample size requirements are somewhat dependent on the characteristics of the collected data and cannot be established until after data have been analysed (Henson & Roberts, 2006).

8 | CONCLUSION

The factor analysis resulted in a seven-factor instrument for importance of clinical leadership needs of nurses and midwives at all levels. The identified factors are applicable to the health care environment of today and the role of the clinical nurse and clinical midwife working in that environment. We have shown CLeeNA to have acceptable psychometric properties for the measurement of leadership needs for qualified nurses and midwives, however, the instrument requires further examination such as test–retest reliability, construct and face validity before use in its current format.

ACKNOWLEDGEMENTS

The authors would like to thank the participants of this study, the Nursing and Midwifery Board of Ireland for distributing the instrument and The National Leadership and Innovation Centre for Nursing and Midwifery, Office of the Nursing and Midwifery Services Director,

Health Service Executive, Ireland for funding the study. The views in this study are those of the research team and not the funder.

ETHICAL APPROVAL

Ethical approval was obtained from the Clinical Research Ethics Committee of the Cork Teaching Hospitals, Cork, Ireland (Reference Number ECM 4 (i) 06/12/16).

ORCID

Vera J. C. Mc Carthy http://orcid.org/0000-0001-7573-7961

REFERENCES

American Organization of Nurse Executives (Producer). (2015). *Nurse executive competencies: Post-acute care*. Chicago, IL: AONE. Retrieved from https://www.aone.org/resources/nec-post-acute.pdf

Barr, J., & Dowding, L. (2012). *Leadership in health care*. London, UK: Sage.

Bass, B. M., & Avolio, B. J. (2000). *MLQ multifactor leadership questionnaire*. Redwood City, CA: Mind Garden.

Casey, M., McNamara, M., Fealy, G., & Geraghty, R. (2011). Nurses' and midwives' clinical leadership development needs: A mixed methods study. *Journal of Advanced Nursing*, *67*(7), 1502–1513. https://doi.org/10.1111/j.1365-2648.2010.05581.x

Cook, J. V., Dickinson, H. O., & Eccles, M. P. (2009). Response rates in postal surveys of healthcare professionals between 1996 and 2005: An observational study. *BMC Health Services Research*, *9* (160). Retrieved from https://bmchealthservres.biomedcentral.com/track/pdf/10.1186/1472-6963-9-160?site=bmchealthservres.biomedcentral.com https://doi.org/10.1186/1472-6963-9-160

Daly, J., Jackson, D., Mannix, J., Davidson, P. M., & Hutchinson, M. (2014). The importance of clinical leadership in the hospital setting. *Journal of Healthcare Leadership*, *2014*(6), 75–83. https://doi.org/10.2147/JHL.S46161

Denker, A. L., Sherman, R. O., Hutton-Woodland, M., Brunell, M. L., & Medina, P. (2015). Florida nurse leader survey findings: Key leadership competencies, barriers to leadership, and succession planning needs. *Journal of Nursing Administration*, *45*(7–8), 404–410. https://doi.org/10.1097/NNA.0000000000000222

Dillman, D. A. (2000). *Mail and internet surveys the tailored design method* (2nd ed.). New York, NY: John Wiley & Sons Inc.

Duffy, K., & Carlin, A. (2014). Enhancing the clinical leadership of band 6 staff. *Nursing Standard*, *29*(11), 40–47. https://doi.org/10.7748/ns.29.11.40.e9090

Dyess, S. M., Sherman, R. O., Pratt, B. A., & Chiang-Hanisko, L. (2016). Growing nurse leaders: Their perspectives on nursing leadership and today's practice environment. *The Online Journal of Issues in Nursing*, *21*(1), Retrieved from https://nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TableofContents/Vol-21-2016/No1-Jan-2016/Articles-Previous-Topics/Growing-Nurse-Leaders.html

El Amouri, S., & O'Neill, S. (2014). Leadership style and culturally competent care: Nurse leaders' views of their practice in the multicultural care settings of the United Arab Emirates. *Contemporary Nurse: A Journal for the Australian Nursing Profession*, *48*(2), 135–149. https://doi.org/10.1080/10376178.2014.11081936

Enterkin, J., Robb, E., & McLaren, S. (2013). Clinical leadership for high-quality care: Developing future ward leaders. *Journal of Nursing Management*, *21*(2), 206–216. https://doi.org/10.1111/j.1365-2834.2012.01408.x

Fitzpatrick, J. J., Modic, M. B., Van Dyk, J., & Hancock, K. K. (2016). A leadership education and development program for clinical nurses. *Journal of Nursing Administration*, *46*(11), 561–565. https://doi.org/10.1097/NNA.0000000000000405

Frankel, A. (2008). Analysing how senior nurses can become effective leaders. *Nursing times*, *104*(35), 23–24.

Galuska, L. A. (2014). Education as a springboard for transformational leadership development: Listening to the voices of nurses. *Journal of Continuing Education in Nursing*, *45*(2), 67–76. https://doi.org/10.3928/00220124-20140124-21

Henson, R., & Roberts, J. (2006). Use of exploratory factor analysis in published research: Common errors and some comment on improved practice. *Educational and Psychological Measurement*, *66*, 393–416. https://doi.org/10.1177/0013164405282485.

Herman, S., Gish, M., & Rosenblum, R. (2015). Effects of nursing position on transformational leadership practices. *Journal of Nursing Administration*, *45*(2), 113–119. https://doi.org/10.1097/NNA.0000000000000165

Hogarty, K., Hines, C., Kromrey, J., Ferron, J., & Mumford, K. (2005). The quality of factor solutions in exploratory factor analysis: The influence of sample size communality, and overdetermination. *Educational and Psychological Measurement*, *65*(2), 202–226. https://doi.org/10.1177/0013164404267287

Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrica*, *30*(2), 179–185. https://doi.org/10.1007/BF02289447

House, R. J. (1971). A path-goal theory of leader effectiveness. *Administrative Science Quarterly*, *16*, 321–338. https://doi.org/10.2307/2391905

Institute of Medicine (US) (Producer). (2011). *The future of nursing: Leading change, advancing health, transforming leadership*. Washington, DC: National Academies Press (US). Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK209881/

National Health Service Leadership Academy (Producer) (2013). The healthcare leadership model. Retrieved from https://www.leadershipacademy.nhs.uk/wp-content/uploads/2014/10/NHSLeadership-LeadershipModel-colour.pdf

Northouse, P. G. (2016). *Leadership: Theory & practice*. 7th Ed. Thousand Oaks, CA: Sage.

Nulty, D. D. (2008). The adequacy of response rates to online and paper surveys: What can be done? *Assessment and Evaluation in Higher Education*, *33*(3), 301–314. https://doi.org/10.1080/02602930701293231

Paterson, K., Henderson, A., & Burmeister, E. (2015). The impact of a leadership development programme on nurses' self-perceived leadership capability. *Journal of Nursing Management*, *23*(8), 1086–1093. https://doi.org/10.1111/jonm.12257

Patton, D., Fealy, G., McNamara, M., Casey, M., O'Connor, T., Doyle, L., & Quinlan, C. (2013). Individual-level outcomes from a national clinical leadership development programme. *Contemporary Nurse: A Journal for the Australian Nursing Profession*, *45*(1), 56–63. https://doi.org/10.5172/conu.2013.45.1.56

Peltzer, J. N., Ford, D. J., Shen, Q., Fischgrund, A., Teel, C. S., Pierce, J., … Waldon, T. (2015). Exploring leadership roles, goals, and barriers among Kansas registered nurses: A descriptive cross-sectional study. *Nursing Outlook*, *63*(2), 117–123.

Scott, A., Kirwan, M., Matthews, A., Lehwaldt, D., Morris, R., & Staines, A. (2013). Report of the Irish RN4CAST Study 2009–2011: A nursing workforce under strain. Retrieved from https://www.lenus.ie/hse/handle/10147/301724

Smith, A. B., King, M., Butow, P., & Olver, I. (2013). A comparison of data quality and practicality of online versus postal questionnaires in a sample of testicular cancer survivors. *Psycho-Oncology*, *22*(1), 233–237. https://doi.org/10.1002/pon.2052

Tabachnick, B., & Fidell, L. (2007). *Using multivariate statistics*. Boston, MA: Pearson Education Inc.

Titzer, J. L., Shirey, M. R., & Hauck, S. (2014). A nurse manager succession planning model with associated empirical outcomes. *Journal of Nursing Administration*, *44*(1), 37–46. https://doi.org/10.1097/NNA.0000000000000019

Ward, P., Clark, T., Zabriskie, R., & Morris, T. (2014). Paper/pencil versus online data collection: An exploratory study. *Journal of Leisure Research*, *46*(1), 84–105. https://doi.org/10.1080/00222216.2014.11950314

West, M., Armit, K., Loewenthal, L., Eckert, R., West, T., & Lee, A. (2015). *Leadership and leadership development in healthcare: The evidence base*. Retrieved from London, https://www.kingsfund.org.uk/sites/default/files/field/field_publication_file/leadership-leadership-development-health-care-feb-2015.pdf

Wong, C. A., Cummings, G. G., & Ducharme, L. (2013). The relationship between nursing leadership and patient outcomes: A systematic review update. *Journal of Nursing Management*, *21*(5), 709–724. https://doi.org/10.1111/jonm.12116

Yukl, G., Wall, S., & Lepsinger, R. (1990). Preliminary report on validation of the managerial practices survey. In K. E. Clark, & M. B. Clark (Eds.), *Measures of Leadership* (pp. 223–238). West Orange, NJ: Leadership Library of America.

How to cite this article: Mc Carthy VJC, Murphy A, Savage E, et al. Development and psychometric testing of the clinical leadership needs analysis (CLeeNA) instrument for nurses and midwives. *J Nurs Manag*. 2018;00:1–11. https://doi.org/10.1111/jonm.12672